Integrated Air and Missile Defense (IAMD) Battle Command System (IBCS)

Industry Day Briefing
20 November 2006

AGENDA

- **Administrative Introduction**

- **IBCS Development Program Overview**
- **-- Break --**
- **Question and Answer Session**
- **Collect Initial Question/Comment Sheets**
- **Adjourn**

Administrative Introduction

- This Is An Unclassified Forum
- Turn Off All Cell Phones
- Recording of This Presentation Is NOT Allowed
- Question and Answer Session
  - Will Only Accept Oral Questions Related to Clarification of the Presentation
  - Will NOT Address Responses to RFI
- Written Questions/Comments Are Encouraged
  - IBCS Industry Day #1 Written Questions/Comments Will Be Accepted 20-27 Nov 2006
  - Will NOT Be Directly Answered, But Will Be Used for RFP Development
  - Comments Will Be Provided Back in General Form at Industry Day #2
  - E-mail for Submission of Questions/Comments Is: Mable.Youngblood@redstone.army.mil (256) 842-7326
- By COB 22 November Presentation Material Will Be Located At: http://www.msl.army.mil (Select the IAMD Icon and Then “IBCS Industry Day #1”)

Required Capabilities

IAMD SoS Capability Development Strategy

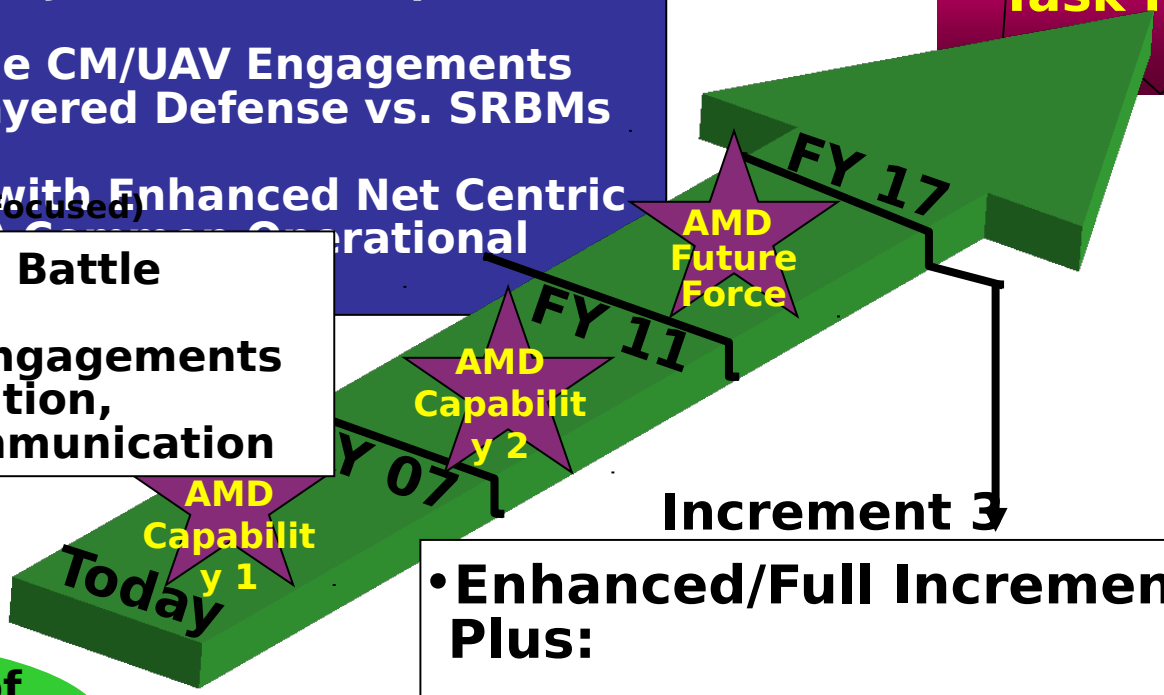
Increment 2

- Common Net-Centric AMD Battle Command w/Expanded IFC (EOR)
- Enhanced Combat ID (Joint SIAP & Improved Data Comms)
- 360° Extended Range CM/UAV Engagements
- Initial Wide Area, Layered Defense vs. SRBMs and MRBMs
- AMD SA/SU for JIM with Enhanced Net Centric (GIG/NCE Compliant) Common Operational

Increment 1 (DOTLPF Focused)

- Initial Common AMD Battle Command
- Improved CM/UAV Engagements
- OIF Fixes…Classification, Correlation and Communication

Joint Integrated AMD Task Forces



Increment 3

- Enhanced/Full Increment 2 Plus:
- 360° Extended Range TBM Engagements
- Initial Common Battle Command for Netted Protection Assets
- Fully Integrated with FCS

An AMD System of Systems Managed by Capabilities

Incrementally Improves Performance as Technology Allows and Threat Evolves

IAMD SoS Increment 2 Draft Key Performance Parameters

(As of 31 July 2006, Not AROC/JROC Approved)

KPP	Details	Rationale
Net Ready*	• DoD Directed KPP • SOSCOE/NCES	• AIAMD Force Will Operate as Part of a Joint Team • ASoS Provides Critical Information Services
Integrated Defense Effectiveness	• Flexible Interceptor Selection and Firing Doctrine • Exploits Fused Organic/Non-Organic Sensor Data • 360-Degree Engagements	• Allows Commander Flexibility to Tailor Asset Defense • Greater Effectiveness against High-Priority Assets • Increases Defenses to Full 360 Degrees
Common Command and Control	• Integrated Fire Control • Plug and Fight • Dynamic Force Tailoring • Sensor to Shooter Linkages (EOR) • Backward Compatibility	• Integration of Multiple Resources • Any C2, Best Sensor, Best Shooter • Modular and Scalable • NLOS/BLOS Capability • Backward Compatibility with Legacy Systems
Sustainability/Reliability *	• ASoS Common Command and Control Ao of 95% or Greater • Embedded	• Glue that Holds Together the ASoS Architecture • High Reliability Assures High Operational Availability

* DoD Directed KPP

Expands the Battlespace and Improves Performance without an Increase in Forces and/or Systems
(Complete Effects Not Fully Achieved until Increment 3)

IAMD SoS Increment 2 Draft Major Attributes

(As of 31 July 2006, Not AROC/JROC Approved)

Major Attributes	Details	Rationale
Classification, Discrimination and Identification/Fratricide Prevention	• Maintain Consistent CID • Mode 4/5 IFF • NCTR	• ID Accuracy of at Least 99% of All Tracked True Friends • Maintain or Improve Existing System CDI Capabilities • Incorporate ESM and HRR
Combat ID/Fratricide Prevention	• Integrate Mark 12A Data to Include Mode S • Integrate NCTR data	• High Demand for ID of All Friendly Aircraft in a Saturated Battle Environment • OIF Lessons Learned
Information Assurance	• DoD Directed	• Force Protection Essential to Maintaining Combat Power • Essential for Preserving Various Levels of Classification in the Battlefield
Transportability/Mobility	• C-17 and C-5 DO/DO • C-130 RO/RO • LASH, SEABEE, LARC-LX RO/RO	• Meet Existing and Future Operational Timelines • Reduce Current Airlift Requirements
Training	• Include all IETMs and Interfaces with TADDS	• Embedded Training
SIAP	• Contribute to/Exploit SIAP	• Maintain/Improve Existing SIAP Metrics

Joint and Army Operational Concepts and Existing Army AMD ORDs and CDD already Contain the Requirements Necessary for Achieving the Initial Increments of IAMD

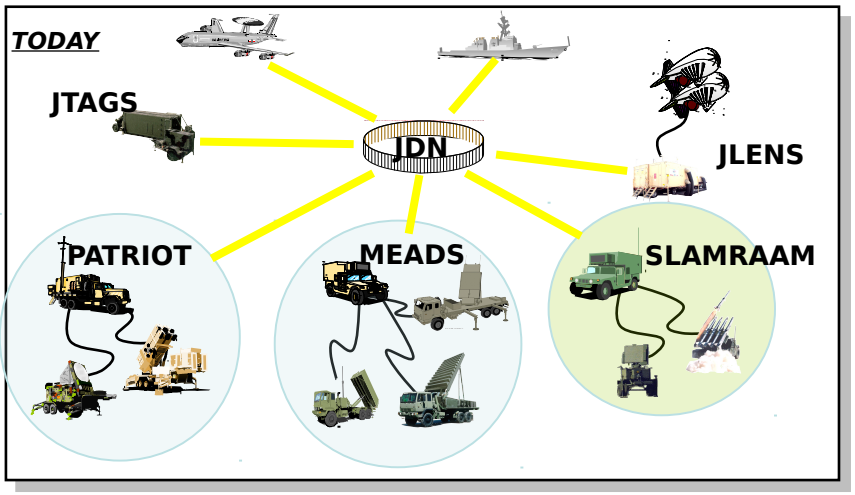
Program Overview

IAMD Program Overview

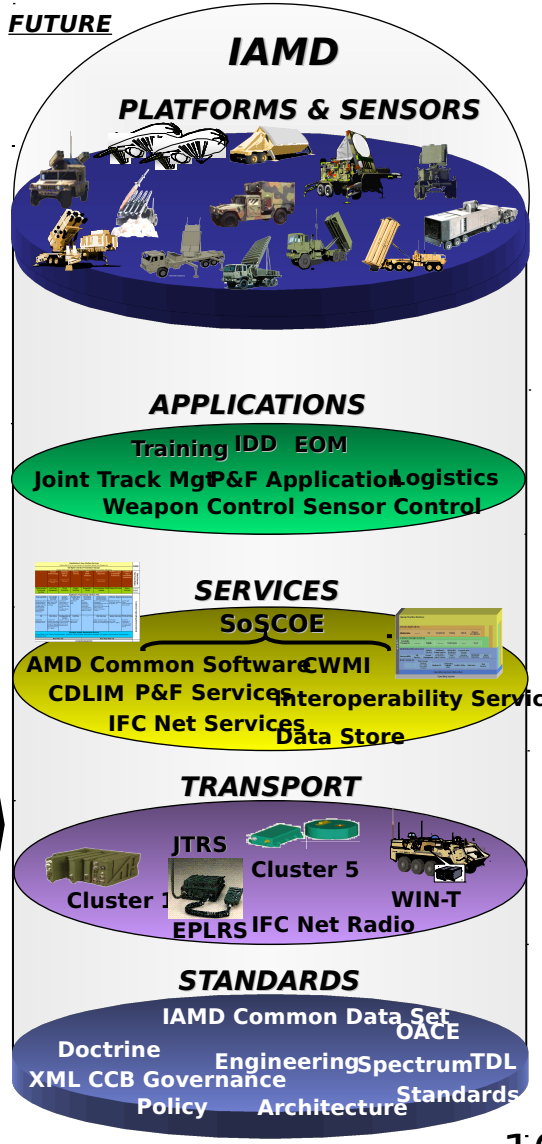
- **Mission Statement:**
  - **Define, Develop, Acquire, Field and Sustain the Army's Portion of the Joint Integrated Air And Missile Defense (IAMD) System of Systems Capability to Be Deployed as Integrated Components in Army, Joint, Interagency, Intergovernmental and Multi-National (JIIM) Net-Centric Architectures**
  - **Develop, Acquire, Field and Sustain the IAMD Battle Command System (IBCS) Component of the Architecture and Integrate Externally Developed Sensors and Shooters to Provide an Effective IAMD Capability**
- **Anticipated 30-Month SDD Phase to Support FY11 IOC**
- **Draft SDD Exit Criteria:**
  - **Successful Operational Assessment Demonstrating Progress toward CDD Threshold Criteria**
  - **Successful Completion of Production Readiness Review**
  - **Complete Development Test Objectives**

IAMD Program Scope

- **Incrementally Develops, Fields and Sustains the IAMD System of Systems Architecture**
- **Defines Interfaces into Army and JIIM Architectures**
- **Defines the Modular, Open Software Architecture Consistent with Joint Initiatives (e.g. SIAP)**
- **Develops, Fields and Sustains a Common IAMD Battle Command System (IBCS)**
- **Enables Common, Joint Training and Sustainment**
- **Requires SEI&T and Synchronization of Army AMD Development with Interfaces to THAAD, ABCS, FCS, BMDS, JTAGS, MEADS, AEGIS, E-10, AWACS, CLAWS, CAC2S, BCS, E-2C, DD(X)**



Migrate AMD Systems to a Tactical and Enterprise Net-Centric Architecture

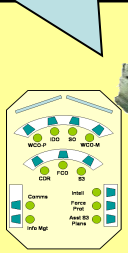


IAMD System Description (Major End Items)

IAMD Architecture
- Component Based
- Incrementally Fielded Capabilities

Common IAMD BMC4I
- Open, Modular HW & SW Architecture
- Integrated EO & FO

Weapon & Sensor Plug & Fight Interfaces
- IAMD Common Software
- Open, Modular HW & SW Architecture
- IFC Net Radio
- Delivered to Component PMs for Integration



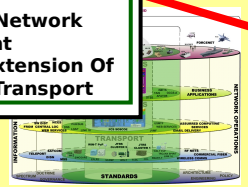
IBCS S/W and CP

Radio Interface	Joint Track Manager
Data Link Interface	CDI
Weapon & Sensor P&F Functions	Threat Evaluation
Weapon & Sensor Tasking	JIIM Interoperability
Situational Awareness	Network Management
	Defense Planning
	ABCS Interface
	GIG Interface
	Sustainment

IAMD Architecture

IFC Net

IFC Network
- High Bandwidth Comms
- Integrated Network Management
- Seamless Extension Of Joint/Army Transport System



FCS

JIIM

Sensor P&F Interface

Unique	Common
I/F to Specific Sensor	Radio Interface
Sensor Control	Data Link Interface
CID Technologies	Sensor P&F Functions
Other Sensor Unique Functions	Sensor Tasking
	CID Fusion
	Joint Track Manager

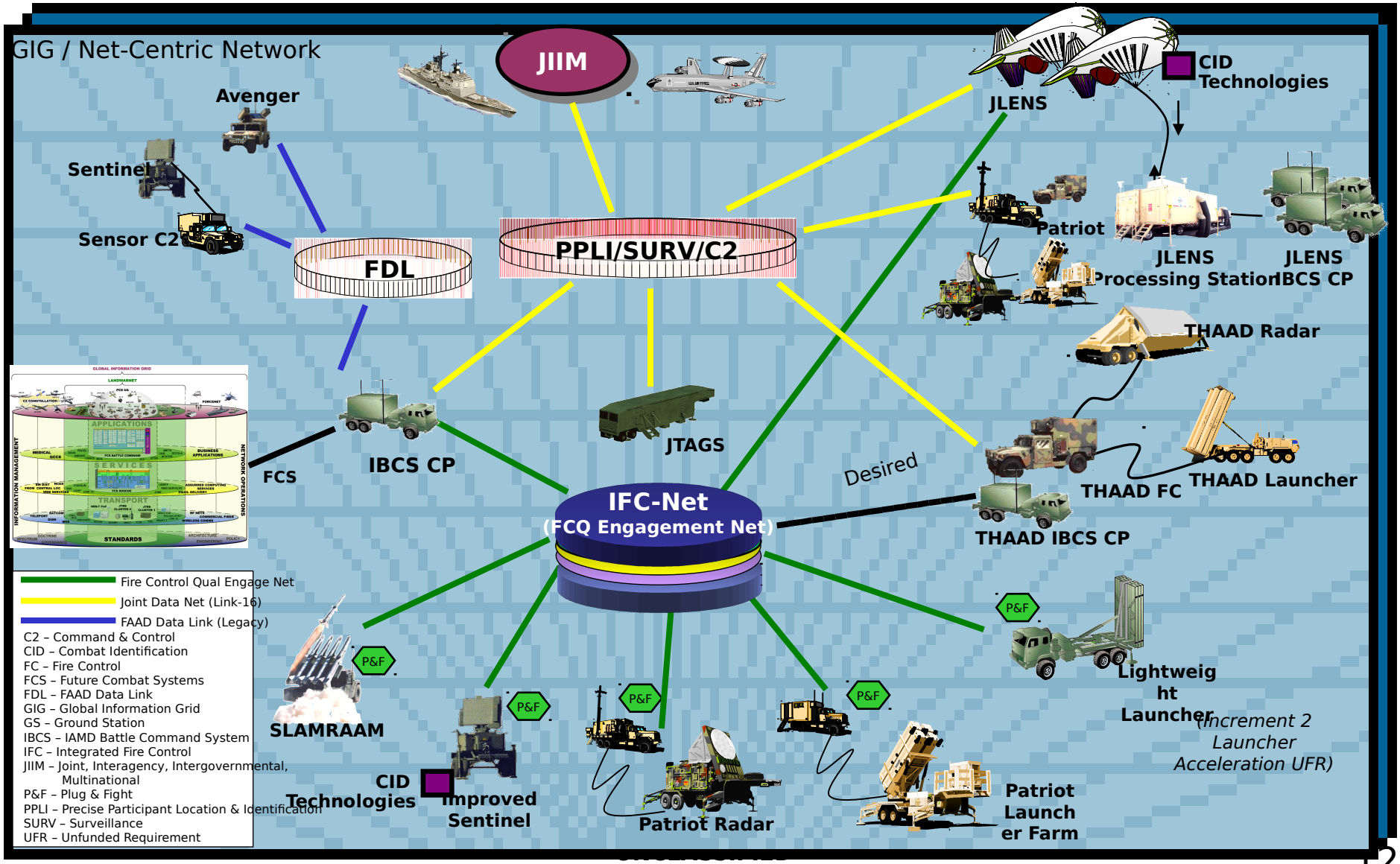
Weapon P&F Interface

Common	Unique
Radio Interface	I/F to Specific Weapon
Data Link Interface	Weapon Control
Weapon P&F Functions	Other Weapon Unique Functions
Weapon Tasking	
CID Fusion	
Joint Track Manager	

IFC Network
- Fire Control Quality Data
- Joint IFC Capable

Use Army Standard Hardware & GIG Components to Meet Requirements

IAMD Increment 2 (FY11) Architecture



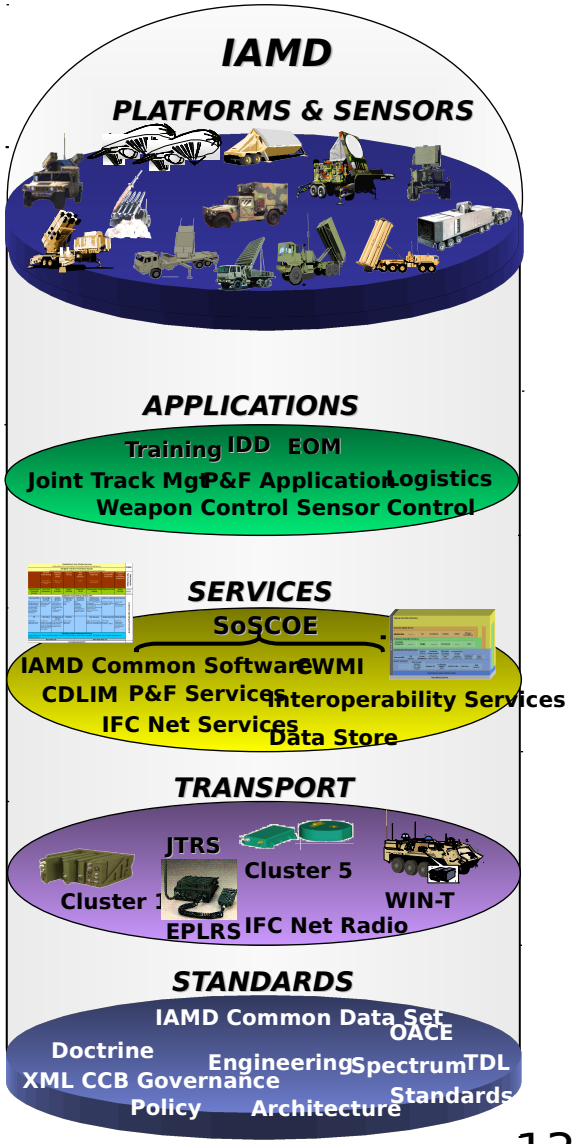
IAMD Increment 2 Products

- **IAMD Common Battle Command Provides:**
  - **IBCS CPs to Include All Vehicles, Shelters, Hardware, Software and Support Equipment**
  - **IBCS Training Devices and Manuals**
  - **IBCS CP (-) as Part of JLENS GS**
  - **IBCS CP (-) as Part of THAAD FC**

- **Plug and Fight Interface Modification Kits to Include Fire Control Net Radios and IAMD Hardware/Software Functionality for*:**
  - **Patriot Launcher Farm - Improved Sentinel**
  - **SLAMRAAM Launcher - Patriot Radar**
  - **MEADS Launcher - ADAM Cell**

Enterprise Net-Centric Products

- **IFC Net Relay (Mod Kits)**



* *Co-Developed With Respective PORs*

IAMD Products Portfolio

IBCS CP | FCE | ILENS | Sentinel | SLAMRAAM | PATRIOT Radar | PATRIOT Lnch

IAMD Battle Command System (IBCS) CP

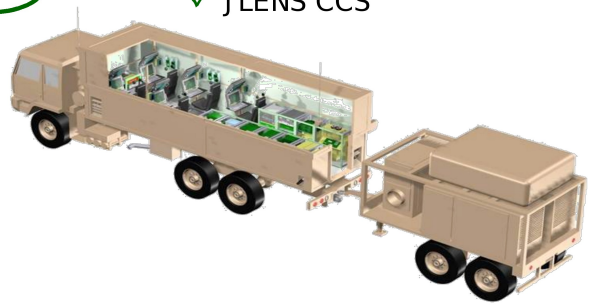
IBCS CP

- Common Warfighter Machine Interface
- Common Operating Services
- Army Force Operations
- Future IAMD Operations
- Current IAMD Operations (Incl.: J TM and CDI)
- Systems Support
- Embedded Training
- Sustainment
- Communications (IFC Net /ABCS/GIG/FCS Interfaces)
- Network Management

Existing & Developmental TOCs + FCE IBCS (US Only) Mod = IBCS CP

Replaces Functionality of:

- ✓ PATRIOT ECS
- ✓ PATRIOT ICC
- ✓ PATRIOT TCS
- ✓ PATRIOT BCP
- ✓ SLAMRAAM IFCS (Plt & Btry)
- ✓ J LENS CCS



Basis of Issue to AMD Composite Battalion

- 1 per PATRIOT Battery (x4)
- 1 per SLAMRAAM Battery
- 1 per SLAMRAAM Platoon (x3?)
- 2 per Composite Battalion HQ

***Total per Composite Battalion* = 10 IBCS CPs**

Uses Existing and Developmental TOCs and Army Standard FCE Technology as the Core to Develop/Field IBCS CP with IFC Technology and Current Force Interfaces

Farm

IAMD Product Lines

Open Arch Computing Environment

- Computing/Display/Mass Storage
- Leverages Army-wide Logistically Supported Items

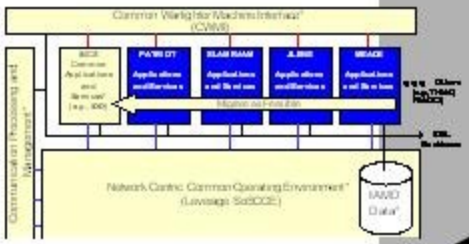
Command Center System (CCS)

- Internal Collaborative Planning
- Large Screen Displays/Facility Equipment

SICPS Family of Tents

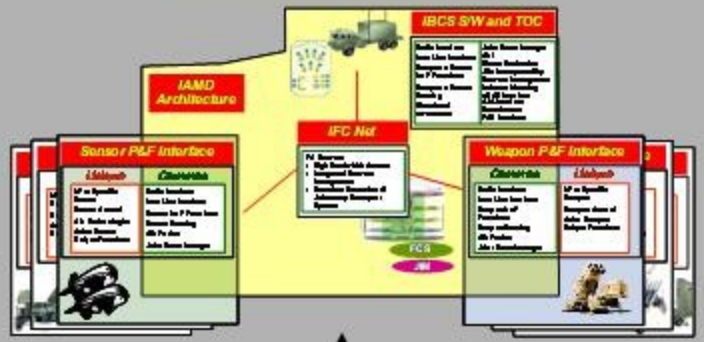
- Uses SICPS Family of Tents
- Trailer Mounted Support System with Environmental Control & Power Generation

IAMD Major End Items



IAMD Common Software

- Open, Net-Centric, Common "Core"
- Leverages Joint and Army-wide SW Developments



Common TOC Platforms

- Standard Shelter Design
- Modular / Flexible TOC
- C-130 Deployable
- Rapid Set-Up
- Jump TOC & Hasty Emplacement
- Leverages Army-wide Logistically Supported Items

Communications

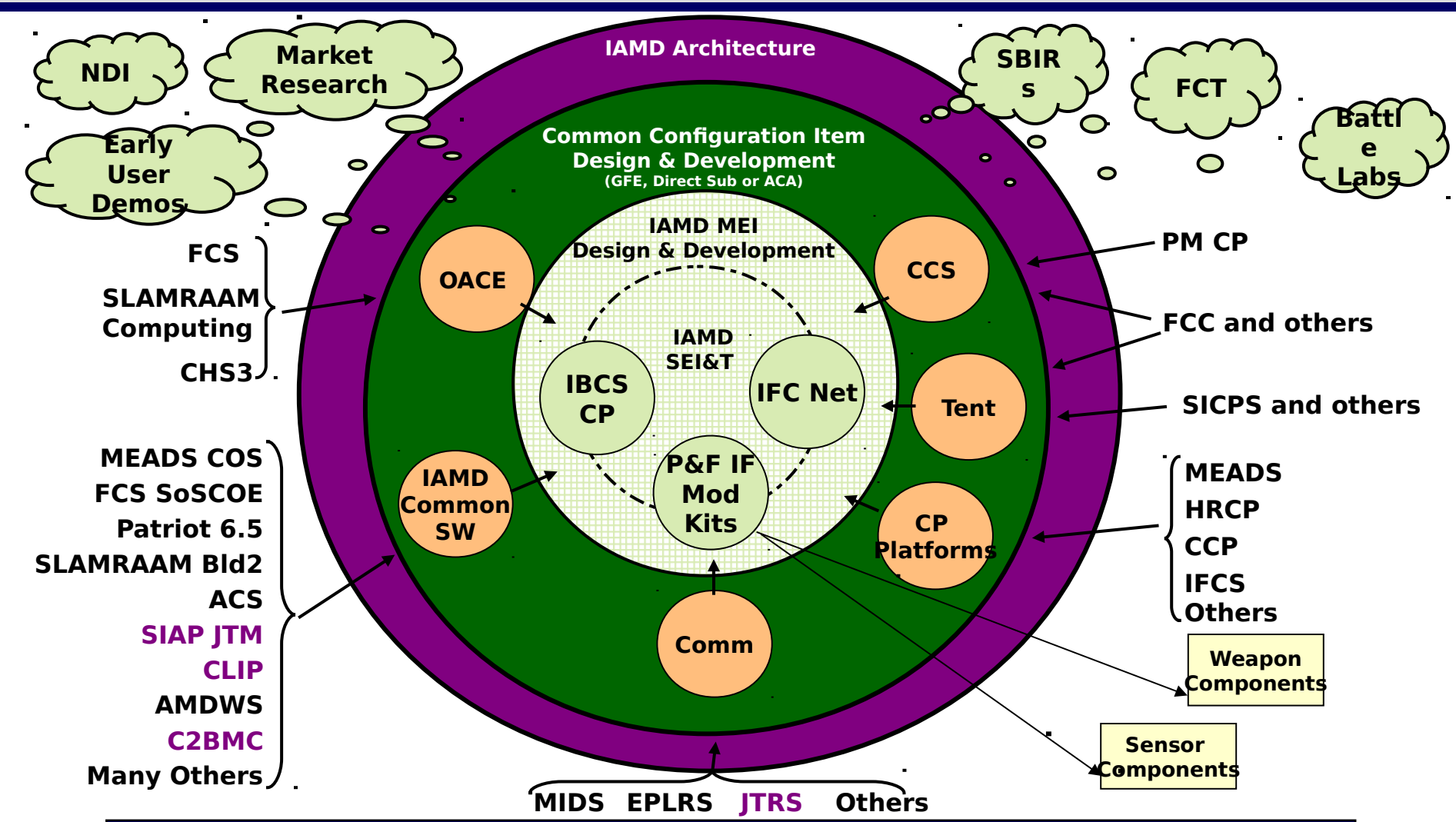
- Voice/Data Radios
- IFC Net High Bandwidth Data Radio

Product Lines for Common Configuration Items Feed MEI Dev

Acquisition Strategy

- **Migrate from System-Based Acquisition to Component-Based Acquisition**
- **Use System of Systems Acquisition Approach with Collaboration among IAMD, LTPO, CMDS, PEO C3T and Other Project Offices to "Network Enable" Weapon and Sensor Components**
  - **Develop Plug and Fight Interface Modification Kits**
  - **Responsible Component PORs Develop System Unique Functionality and Integrate Plug and Fight Modification Kits**
- **Develop and Procure Common IBCS CP that Replaces Multiple Weapon System Unique BMC4I Components**
  - **Leverage Existing/Developmental or Army Standard TOCs as IBCS CP Basis**
  - **Develops an IBCS CP Modification Kit that Establishes US-Only IFC Capabilities**
  - **Incorporates Common Army Supportable Hardware Configuration Items where Appropriate**
- **Establish Product Lines Used to Evaluate and Select, Modify and Integrate Hardware and Software Common Configuration Items**
- **Conduct System of Systems Architecture-Based SEI&T Activities and Develop Supportability Strategy Early in Lifecycle**

IAMD/IBCS Acquisition Approach

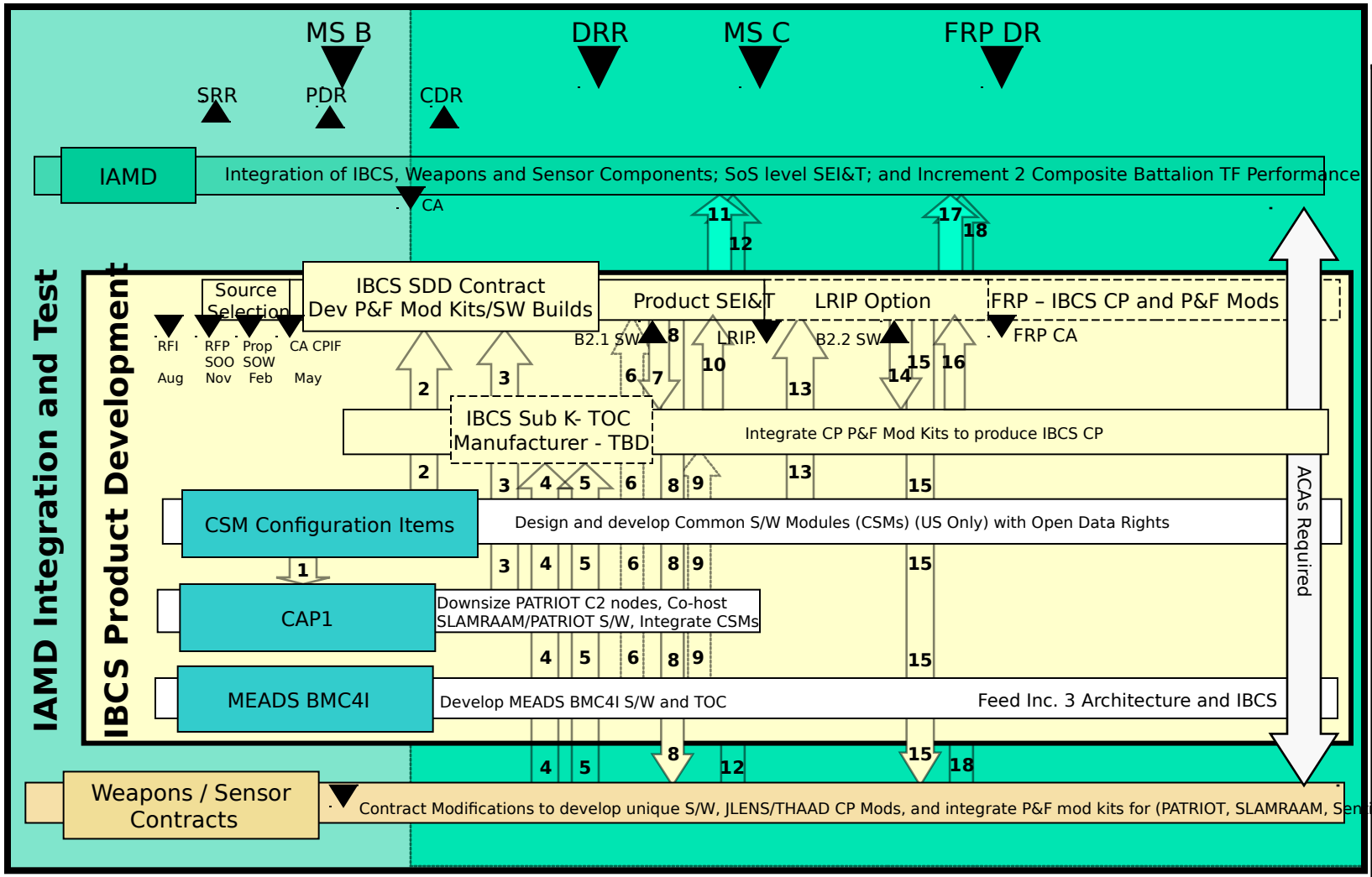


Migration through "Best Breed" Common Configuration Items

IAMD Increment 2
Unofficial Draft Acquisition Plan

(For Planning Purposes Only)

FY06	FY07	FY08	FY09	FY10	FY11	FY12	FY13

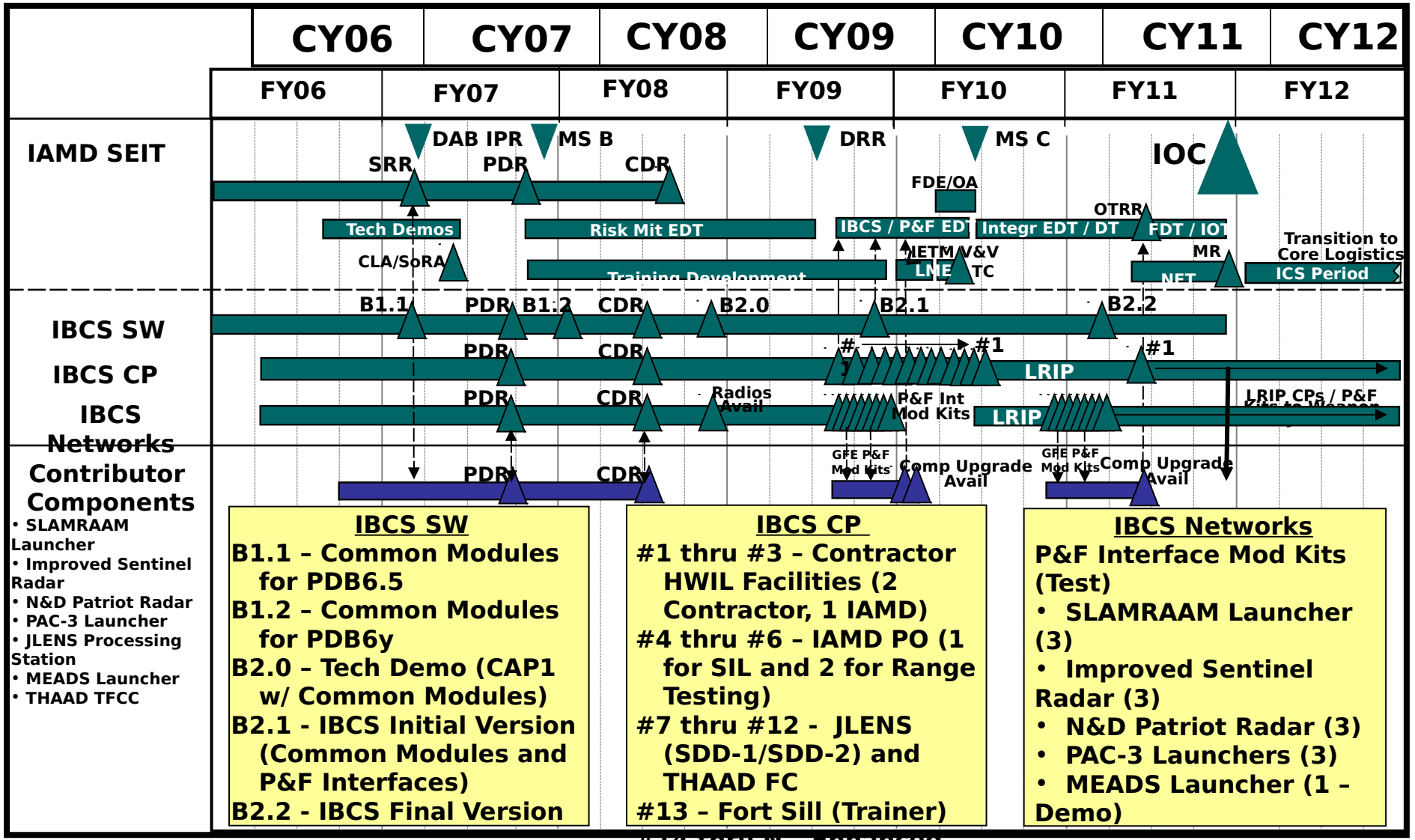

MS B
DRR
MS C
FRP DR
SRR
PDR
CDR
IAMD
Integration of IBCS, Weapons and Sensor Components; SoS level SEI&T; and Increment 2 Composite Battalion TF Performance
CA
IAMD Integration and Test
IBCS Product Development
Source Selection
IBCS SDD Contract
Dev P&F Mod Kits/SW Builds
Product SEI&T
LRIP Option
FRP – IBCS CP and P&F Mods
RFI Aug
RFP SOO Nov
Prop SOW Feb
CA CPIF May
B2.1 SW
LRIP
B2.2 SW
FRP CA
IBCS Sub K- TOC Manufacturer - TBD
Integrate CP P&F Mod Kits to produce IBCS CP
CSM Configuration Items
Design and develop Common S/W Modules (CSMs) (US Only) with Open Data Rights
CAP1
Downsize PATRIOT C2 nodes, Co-host SLAMRAAM/PATRIOT S/W, Integrate CSMs
MEADS BMC4I
Develop MEADS BMC4I S/W and TOC
Feed Inc. 3 Architecture and IBCS
ACAs Required
Weapons / Sensor Contracts
Contract Modifications to develop unique S/W, JLENS/THAAD CP Mods, and integrate P&F mod kits for (PATRIOT, SLAMRAAM, Sentinel)

Legend

Deliver the following:

1. **IDD/CDLIM CSMs**
2. **CSMs**
3. **CAP1 S/W**
4. **JLENS CP Requirements/Mod kits**
5. **THAAD CP Requirements/Mod kits**
6. **MEADS S/W**
7. **CP P&F Mod kits**
8. **Weapon/Sensor P&F Mod kits**
9. **MEADS TOC**
10. **IBCS CP to IBCS Integrator**
11. **IBCS CP to IAMD Integrator**
12. **Net-Enabled Weapons /Sensors**
13. **Updated CSMs**
14. **CP P&F Mod kits**
15. **Weapon/Sensor P&F Mod kits**
16. **IBCS CP to IBCS**

IAMD Program Increment 2 Master Schedule



Contributor Components

- SLAMRAAM Launcher
- Improved Sentinel Radar
- N&D Patriot Radar
- PAC-3 Launcher
- JLENS Processing Station
- MEADS Launcher
- THAAD TFCC

IBCS SW

B1.1 – Common Modules for PDB6.5
B1.2 – Common Modules for PDB6y
B2.0 – Tech Demo (CAP1 w/ Common Modules)
B2.1 - IBCS Initial Version (Common Modules and P&F Interfaces)
B2.2 - IBCS Final Version

IBCS CP

#1 thru #3 – Contractor HWIL Facilities (2 Contractor, 1 IAMD)
#4 thru #6 – IAMD PO (1 for SIL and 2 for Range Testing)
#7 thru #12 - JLENS (SDD-1/SDD-2) and THAAD FC
#13 – Fort Sill (Trainer)
#14 thru N – Enhanced

IBCS Networks

P&F Interface Mod Kits (Test)
- SLAMRAAM Launcher (3)
- Improved Sentinel Radar (3)
- N&D Patriot Radar (3)
- PAC-3 Launchers (3)
- MEADS Launcher (1 – Demo)

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IBCS Development Program Contracting Milestones

		Estimated Dates
✓	Draft IAMD Acquisition Strategy	
✓	Complete Draft Statement of Objective (SOO)	14 Aug 06
✓	Prepare and Issue Request for Information (RFI)	28 Aug 06
✓	Receive Responses to RFI	22 Sep 06
✓	Review Responses to RFI	11 Oct 06
•	First Draft RFP	09 Nov 06
•	DA/OSD First Draft RFP Review	14 -16 Nov 06
•	Conduct Industry Day Briefing #1	20 Nov 06
•	IBCS RFP Second Draft Review	4 – 8 Dec 06
•	Functional Requirements Authentication Board (FRAB)	11 Dec 06
•	OIPT Approval of IAMD Acquisition Strategy	12 Dec 06
•	Issue Draft RFP	13 Dec 06
•	Complete Review Draft RFP Comments from Industry	05 Jan 07
•	Conduct Industry Day Briefing #2	Mid-Jan 07
•	Complete Contract Requirements Package	23 Jan 07
•	Issue Solicitation	01 Feb 07
•	Proposal Received	15 Mar 07
•	Audits/Proposal Evaluation	31 May 07
•	Award Contract	25 Jun 07

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IBCS CLIN Structure

- **PHASE I – Risk Reduction (POP – 4 to 10 Months)**
- **PHASE II – SDD (POP – About 30 Months)**
- **PHASE III – Production and Deployment (POP – About 24 Months)**

Contract Incentives

Incentive fees to affect cost and schedule control

Linked Charts

IAMD Products Portfolio

IBCS CP | FCE | ILENS | Sentinel | SLAMRAAM | PATRIOT Radar | PATRIOT Lnch

IAMD Battle Command System (IBCS) CP

IBCS CP

- Common Warfighter Machine Interface
- Common Operating Services
- Army Force Operations
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- Embedded Training
- Sustainment
- Communications (IFC Net /ABCS/GIG/FCS Interfaces)
- Network Management

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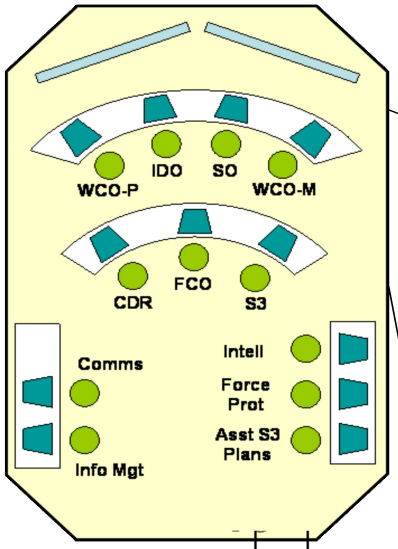
Farm

IAMD Products Portfolio

IBCS CP | FCE | JLENS | Sentinel | SLAMRAAM | PATRIOT Radar | PATRIOT Lnch

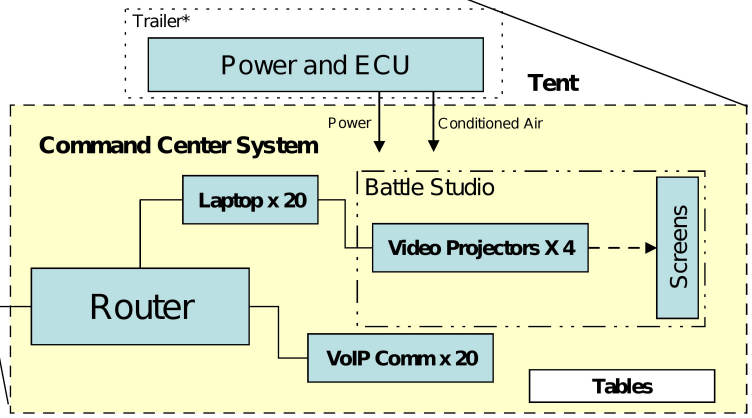
Fire Control Element Subsystem



IBCS CP Platform
- External Communication
- Servers

- Enables Army Battle Command Collaborative Operations
- Part of the AMD Battalion/Battery CP
- Uses Army Standard Equipment (SCIPS, CHS, CCS, etc.)

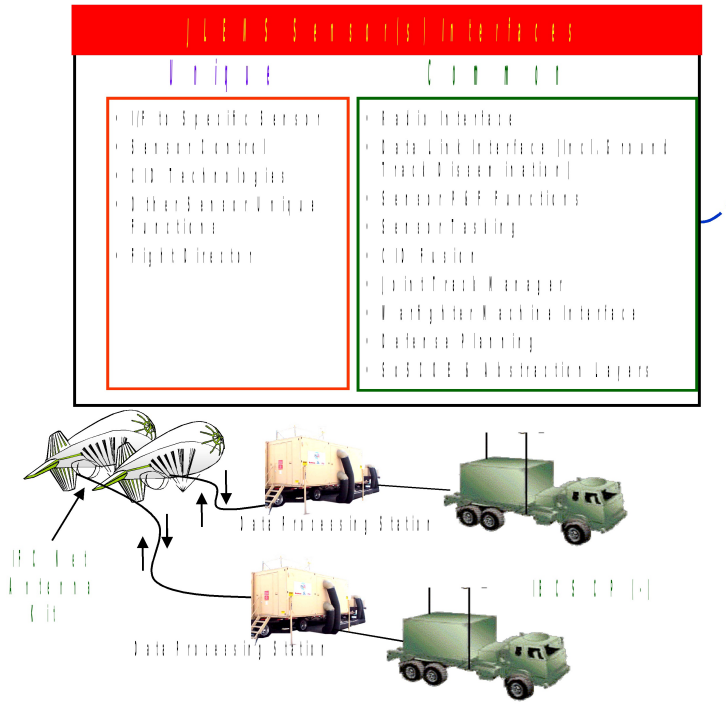
1 per IBCS CP
Total = 10/Bn



* Assumes the Availability of a existing unit HMMV

IAMD Products Portfolio

IBCS CP | FCE | ILENS | Sentinel | SLAMRAAM | PATRIOT Radar | PATRIOT Lnch



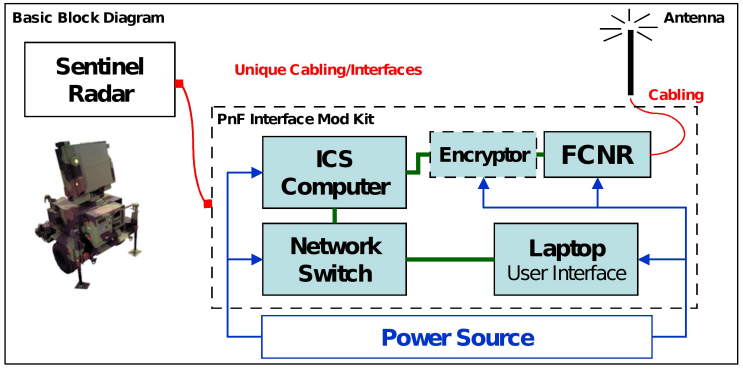
IAMD Products Portfolio

IBCS CP | FCE | JLENS | Sentinel | SLAMRAAM | PATRIOT Radar | PATRIOT Lnch

Improved Sentinel Radar

Sentinel Sensor P&F Interface

Unique	Common
• I/F to Specific Sensor	• Data Link & Radio Interfaces
• Sensor Control	• Sensor P&F Functions
• CID Technologies	• Sensor Tasking
• Other Sensor Unique Functions	• CID Fusion
	• Joint Track Manager
	• ASoS COE & Abstraction Layers



- ❑ **IBCS P&F Interface Modification "B" Kits**
  - ✓ FCS Integrated Computer System (ICS) (VME Chassis with SBCs) with P&F SW
  - ✓ Network Switch (CHS)
  - ✓ Fire Control Net Radio (FCNR)
  - ✓ Encryption Equipment (Standard)
  - ✓ Antenna and Cabling (CECOM)
  - ✓ Laptop Computer
- ❑ **Sensor Component Modification "A" Kits**
  - ✓ Component Unique Cabling/Racking
  - ✓ Component Unique SW
  - ✓ Logistics Product Changes

IAMD Products Portfolio

IBCS CP | FCE | JLENS | Sentinel | SLAMRAAM | PATRIOT Radar | PATRIOT Lnch

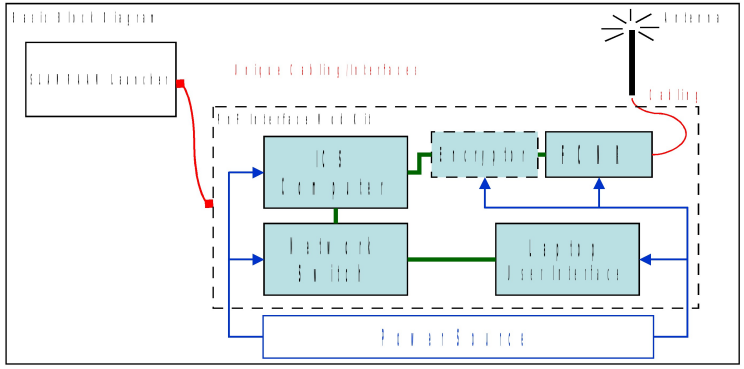
SLAMRAAM Launcher

- Common Warfighte Machine Interface
- Common Operating Services

Basis of Issue t
- 1 per PATRIOT
- 1 per SLAMRA
- 1 per SLAMRA
- 2 per Composit

Total per Composi

Uses Existing a Core to Devel



Farm

IAMD Products Portfolio

IBCS CP | FCE | JLENS | Sentinel | SLAMRAAM | PATRIOT Radar | PATRIOT Lnch

PATRIOT Radar

IB

- Common Warfighter Machine Interface
- Common Operating Services

Basis of Issue to AM

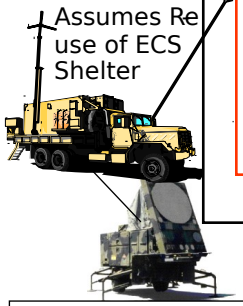
- 1 per PATRIOT Batte
- 1 per SLAMRAAM Ba
- 1 per SLAMRAAM Pl
- 2 per Composite Batt

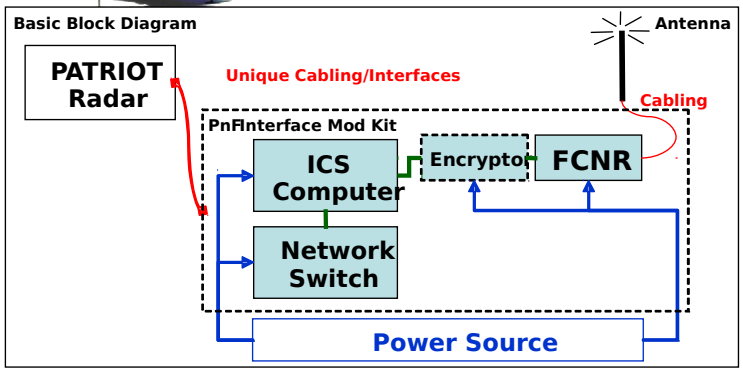
Total per Composite Bat

Uses Existing and I Core to Develop/F

PATRIOT Sensor P&F Interface

Unique	Common
• I/F to Specific Sensor • Sensor Control • CID Technologies • Other Sensor Unique Functions	• Data Link & Radio Interfaces • Sensor P&F Functions • Sensor Tasking • CID Fusion • Joint Track Manager • ASoSCOE & Abstraction Layers





- ❑ **IBCS P&F Interface Modification Kits**
  - ✓ FCS Integrated Computer System (ICS) (VME Chassis with SBCs) with P&F SW
  - ✓ Network Switch (CHS)
  - ✓ Fire Control Net Radio (FCNR) (Radio)
  - ✓ Encryption Equipment (Standard)
  - ✓ Antenna and Cabling (CECOM)
- ❑ **Radar Shelter and Component Modification "A" Kits for P&F Integration**
  - ✓ Modify and Reshelterize ECS Radar Configuration Items
  - ✓ Component Unique Cabling/Racking for P&F Interface
  - ✓ Component Unique SW to Integrate P&F
  - ✓ Logistics Changes

IAMD Products Portfolio

IBCS CP | FCE | JLENS | Sentinel | SLAMRAAM | PATRIOT Radar | PATRIOT Lnch

PATRIOT Launch Platform

IBCS

- Common Warfighter Machine Interface
- Common Operating Services

Basis of Issue to AMD Cor
- 1 per PATRIOT Battery (x4
- 1 per SLAMRAAM Battery
- 1 per SLAMRAAM Platoon
- 2 per Composite Battalion

Total per Composite Battalion

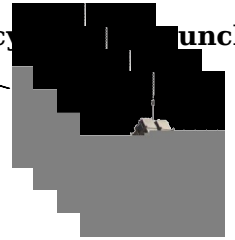
Uses Existing and Deve Core to Develop/Field

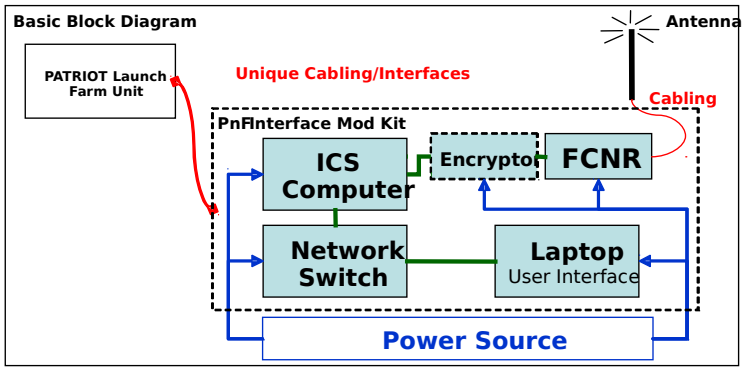
Weapon P&F Interface

Common	Unique
Data Link & Radio Interfaces Weapon P&F Function Weapon Tasking CID Fusion Joint Track Manager ASoSCOE & Abstraction Layers	• I/F to Specific Weapon • Weapon Control • Other Weapon Unique Functions

Launch Farm Unit

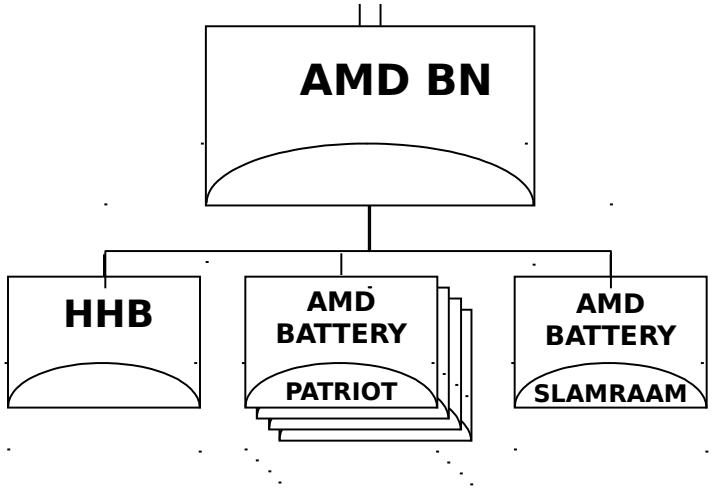
Legacy uncher Farm



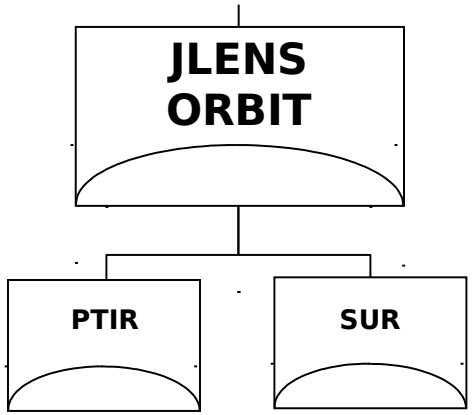


- ❑ **IBCS P&F Interface Modification Kits**
  - ✓ FCS Integrated Computer System (ICS) (VME Chassis with SBCs) with P&F SW
  - ✓ Network Switch (CHS)
  - ✓ Fire Control Net Radio (Radio)
  - ✓ Encryption Equipment (Standard)
  - ✓ Antenna and Cabling (CECOM)
  - ✓ Laptop Computer
- ❑ **Weapon Component Modification Kits**
  - ✓ Component Unique Cabling/Racking
  - ✓ Component Unique SW
  - ✓ Component Logistics Changes

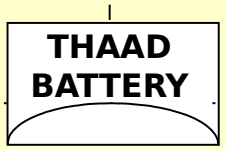
IAMD Increment 2
Reference Composite BN TF



- **10 IBCS CP**
- 4 PATRIOT Radar Units **(with P&F Mods)**
- 24 PATRIOT Launchers
- 8 PATRIOT Launch Farm Units **(with P&F Mods)**
- 8 Sentinel Radars **(with P&F Mods)**
- 12 SLAMRAAM Launchers **(with P&F Mods)**
- 4 Comms Relay Groups **(with P&F Mods)**
- 4 Antenna Mast Groups **(with Antennas)**



- 2 Platforms w/PTIR/Sur Radar/Comm Payload **(Add Antenna Mod Kits)**
- 2 Ground Stations **(Add 2 IBCS(-) CPs)**



- 1 THAAD TFCC **(Add 1 IBCS(-) CP)**
- 1 THAAD Radar
- 3 THAAD Launchers

**Details Pending Further Definition and MOA